

FIG. 1

Job Data Table		
<i>Field Name</i>	<i>Field Type</i>	<i>Field Description</i>
No	numerical	the number of entrusted job from iTDAS
Done	character	the record whether the job had been finished
User	character	the user of the job
Date	time	the date and time of the job
Type	character	the package type of the job
Die Size L	numerical	the length of die size
Die Size W	numerical	the width of die size
Pad Size L	numerical	the length of pad size
Pad Size W	numerical	the width of pad size
Package Size L	numerical	the length of package size
Package Size W	numerical	the width of package size
TBL	numerical	the number of thermal ball along the row direction
TBW	numerical	the number of thermal ball along the column direction
BRL	numerical	the number of ring ball along the row direction
BRW	numerical	the number of ring ball along the column direction
Layer	numerical	the number of substrate layer
PW	numerical	the number of dissipation power
Check	character	whether the job is successful
Memo	character	the remark or memo of the job

FIG. 2

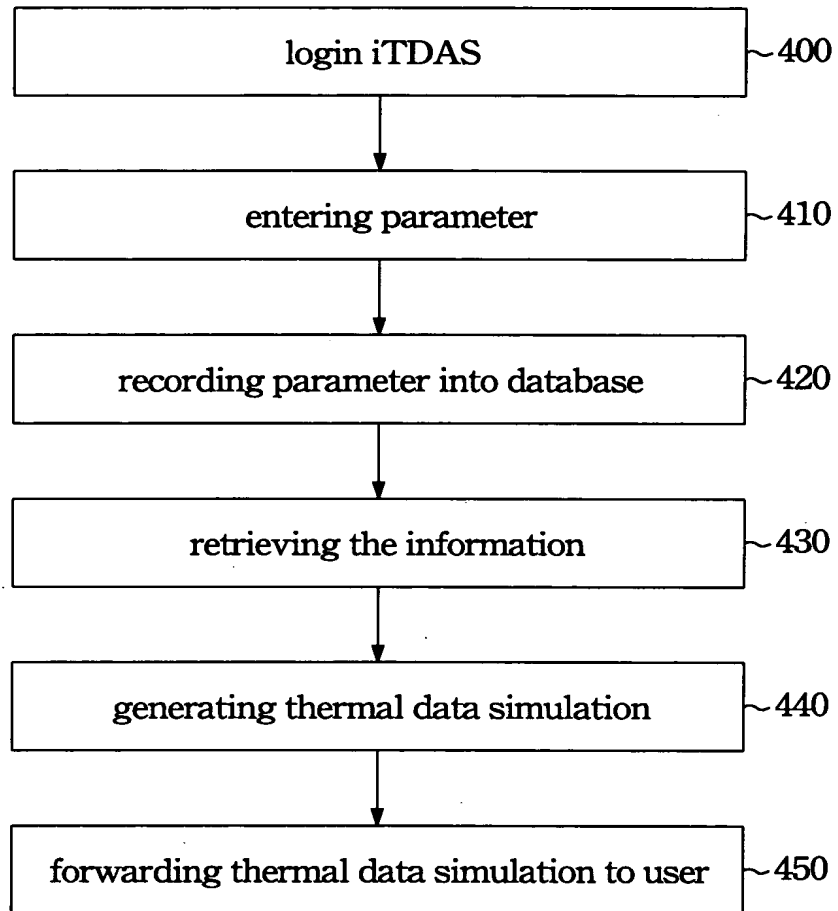


FIG. 3

► 1. The fundamental profile

User name	CATHY
Requested time	2001/2/6 AM 09:49:07
Completed time	2001/2/6 AM 09:52:17
Account quota	9999
Quota used	311
Account validation	1999/11/15~2002/12/31

► 2. Simulation condition

Job title	ITDAS HSBGA
Package type	HSBGA
Ball count	388
Pitch (mm)	1.27
PKG size (mm)	35 X 35
Balls matrix	26 X 26
Ball rows depth L	4
Ball rows depth W	4
Thermal balls	6 X 6
Thermal vias	81
Pad size (mm)	12 X 12
Die size (mm)	8 X 8
Heat slug	Y
Substrate layers	4L
PCB layers	4L
Power (watt)	3
Maximum junction temperature (°C)	125
Ambient temperature (°C)	85

► 3. Thermal data

Vair (m/s)	0.0	1.0	2.0
$\theta_{ja}$	13.3	11.5	10.1
$\phi_{jt}$	2.96	2.95	2.98
$\theta_{jc}(^{\circ}\text{C/W})$	4.2		

Heat flow path

Heat dissipated from PCB (%)	68.6
Heat dissipated from package top (%)	14.1
Heat dissipated from others (%)	17.3

► 4. Solution

Your required  $\theta_{jc}$  is 13.3 (°C/W)

FIG.4

*Internet Thermal Data Automation Service*

Job Title :

1. PACKAGE SIZE & PITCH

PBGA PACKAGE SIZE (mm x mm)    $P_L \times P_W$

PBGA Pitch (mm) :

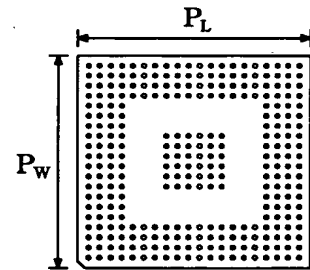


FIG. 5

Job Title :

2. BALL LAYOUT

Balls number in x and y direction

$B_L \times B_W$

Number of ring of ball in x and y direction

$BR_L$  :

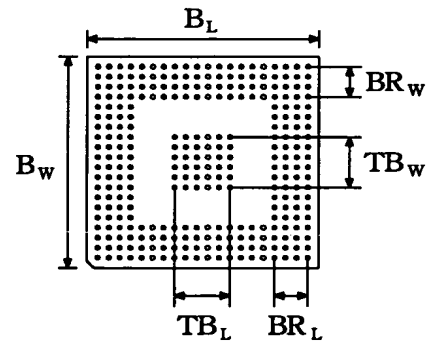
$BR_W$  :

Thermal ball number in x and y direction  
(if  $B_L$  is odd (even),  $TB_L$  has to be odd (even))

$TB_L$  :

$TB_W$  :

Total number of thermal via



Total number of balls :

FIG. 6

Job Title :

### 3. DIE SIZE AND PAD SIZE

DIE SIZE,  $D_L$  (mm)

DIE SIZE,  $D_w$  (mm)

PAD SIZE,  $DP_L$  (mm)

PAD SIZE,  $DP_w$  (mm)

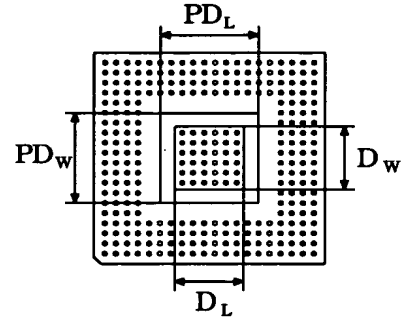


FIG. 7

Table 1 The maximum die size and copper pad size for each BGA size.

<i>Package type</i>	<i>Package size (mm)</i>	<i>Idealmas. die size (mm)</i>
PBGA	14 X 22	8.4 X 15.8
	23 X 23	13.5 X 13.5
	27 X 27	15.9 X 15.9
	31 X 31	18.9 X 18.9
	35 X 35	21.9 X 21.9
	37.5 X 37.5	25.2 X 25.2
	40 X 40	25.4 X 25.4
HSBGA	27 X 27	12.8 X 12.8
	31 X 31	15.3 X 15.3
	35 X 35	15.3 X 15.3
	37.5 X 37.5	17.4 X 17.4
	40 X 40	17.4 X 17.4
LBGA	13 X 13	8.3 X 8.3
	15 X 15	10.3 X 10.3
	17 X 17	12.3 X 12.3
	19 X 19	14.3 X 14.3

FIG. 8

Job Title :

#### 4. OTHER CONDITION

Substrate Layers  ▼

PCB Layers  ▼

$T_L$  (Max Junction Temperature)

$T_A$  (Ambient Temperature)

Power Dissipation (Watt)

FIG. 9

Job Title :

PKG Size (mm x mm)	27 X 27	Pitch (mm)	27 X 27
$B_L \times B_w$	15 X 15		
$BR_L$	5	$BR_w$	5
$TB_L$	5	$TB_w$	5
Die Size , $D_L$ (mm)	8	Die Size , $D_w$ (mm)	8
Pad Size , $DP_L$ (mm)	9.5	Pad Size , $DP_w$ (mm)	9.5
Substrate Layers	4L	PCB Layers	6L
$T_J$ (Mix junction Temperature)	125	$T_A$ (Ambient Temperature)	55
Power Dissipation (W)	2.6		

FIG. 10